

Serial No. 10/698,217

Docket No. – BAT 0033 NA/40078.251/12755CON1

Remarks

Claims 1-36 were pending. Claims 1 and 24 have been amended. As a result of this amendment, claims 1-36 remain pending. Reconsideration and reexamination are respectfully requested in view of the amendments and the following remarks.

The rejection of claims 1-6, 8-13, 20, 22-23, 25-26, 28-31, and 34-36 under 35 U.S.C. §102(b) as being anticipated by Riebel has been overcome. Riebel discloses a fiber-reinforced protein-based biocomposite particulate material containing a legume-based thermosetting resin and cellulosic material, and rigid biocomposite pressure-formed materials produced therefrom. The particulate material and resultant pressure-formed materials contain the legume-based resin and fibrous cellulosic material in amounts such that the ratio of cellulose solids to resin solids is about 0.8:1.0 to about 1.5:1.0.

According to the examiner, “Riebel et al further discloses that the resin is present in an amount from about 40% to about 56%, which overlaps the claimed range (col 8, lines 37-41.” Applicants believe the examiner meant col. 5, lines 37-41, because col. 8, lines 37-41 does not discuss the amount of resin present in Riebel’s composite. In any case, the amount of resin in Riebel does not overlap the limitation that “the resin binder is present in an amount of less than 40% by weight of the composite.” Support for the amendment to claim 1 can be found in paragraph [0032].

The discussion at col. 5, lines 37-41 of the amount of resin solids in the composite refers to the amount of the *protein-based resin*, not the total amount of protein-based resin and synthetic resin.

The biocomposite particulate material of the present invention, and the resultant pressure-formed products, include primarily renewable resources, i.e., cellulosic material, such as recycled newspaper, and a *protein-based resin* prepared from ground leguminous material, such as soy flour. That is, the particulate material is primarily a cellulose reinforced vegetable protein-based thermosetting resin system. *This protein-based resin (also referred to as a legume-based resin)* forms the matrix, i.e., the primary binding agent, of the biocomposite material of the present invention, whether in the form of particulate material or pressure-formed material. Preferably, on a dry weight basis, the ratio of *cellulose to resin solids, e.g., paper to soy flour*, is about 0.8:1.0 to about 1.5:1.0,

Serial No. 10/698,217

Docket No. – BAT 0033 NA/40078.251/12755CON1

and more preferably about 1.0:1.0 to about 1.3:1.0. Thus, the amount of the *thermosetting resin solids relative to the total amount of resin solids and cellulose solids* in the particulate material prior to pressure-forming is preferably about 40-45%, and more preferably about 43-50%.

Col. 5, lines 23-41 (Emphasis added).

In Riebel, the dry particulate (legume-based resin and cellulosic material after a drying process, see col. 6, lines 43-59 and col. 12, lines 53-64) can be coated with a secondary thermosetting binder, such as isocyanate, phenolic, melamine, or urea-containing binder. Riebel discloses the use of about 2-20% isocyanate based on the total weight of the dry biocomposite particles. Col. 12, lines 40-52 and Example 8. The secondary thermosetting binder is in addition to the 40-56% of the legume-based resin based on the total amount of resin solids and cellulose solids which is already present in the particulate material. Thus, the amount of legume-based resin and secondary resin would be more than 40% of the particulate material.

Therefore, claims 1-6, 8-13, 20, 22-23, 25-26, 28-31, and 34-36 are not anticipated by Riebel.

The rejection of claim 7 under 35 U.S.C. §103(a) as being unpatentable over Riebel has been overcome. As discussed above, Riebel does not teach or suggest the limitation that “the resin binder is present in an amount of less than 40% by weight of the composite.” In fact, Riebel teaches away from using less than 40% resin binder. Therefore, claim 7 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel.

The rejection of claims 14 and 15 under 35 U.S.C. §103(a) as being unpatentable over Riebel in view of Holmberg has been overcome. Holmberg is cited as teaching “a binder composition comprising phenol formaldehyde that can be used with cellulosic material, such as wood chips” and that “the aldehyde can be either formaldehyde or paraformaldehyde.” Holmberg does not remedy the deficiencies of Riebel. Therefore, claims 14 and 15 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel in view of Holmberg.

The rejection of claims 16-19 under 35 U.S.C. §103(a) as being unpatentable over Riebel in view of Hse and further in view of Wynstra has been overcome. Hse is cited as teaching “an OSB panel having an adhesive comprising a soy protein hydrozylate, caustic, formaldehyde, and

Serial No. 10/698,217
Docket No. – BAT 0033 NA/40078.251/12755CON1

phenol. The molar ratio of formaldehyde to phenol to caustic is 1.65:1:0.65, which is similar to the disclosed composition.” Wynstra is cited as teaching “a thermosetting resin composition comprising a fibrous material, phenol, formaldehyde and a base catalyst,” and that “under alkaline conditions, phenol and formaldehyde condense to form methylols.” Neither Hse nor Wynstra remedy the deficiencies of Riebel. Therefore, claims 16-19 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel in view of Hse and further in view of Wynstra.

The rejection of claim 21 under 35 U.S.C. §103(a) as being unpatentable over Riebel in view of Blizzard has been overcome. Blizzard is cited as teaching “a silicone coating composition useful for coating a substrate to provide a water resistant coating.” Blizzard does not remedy the deficiencies of Riebel. Therefore, claim 21 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel in view of Blizzard.

The rejection of claim 24 under 35 U.S.C. §103(a) as being unpatentable over Riebel in view of Roubicek has been overcome. Roubicek is cited as teaching that “felting is a standard process used to produce hardboard.” Roubicek does not remedy the deficiencies of Riebel. Therefore, claim 24 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel in view of Roubicek.

The rejection of claims 27 and 32-33 under 35 U.S.C. §103(a) as being unpatentable over Riebel in view of Johns has been overcome. Johns is cited as teaching that “a commercially popular resin for use in making particle boards is polymeric isocyanate.” Johns is also cited as teaching that “phenolic resins, although inexpensive, have a slow cure and require resin in excess of that normally necessary to overcome the swelling tendency of cellulose when exposed to moisture and caustic,” and that “[i]socyanate resins are fast curing and can be used at approximately half the rate of application of phenolic resins to achieve the same strength, but are expensive.” Johns does not remedy the deficiencies of Riebel. Therefore, claims 27 and 32-33 would not have been obvious to one of ordinary skill in the art at the time of the invention over Riebel in view of Johns.

The rejection of claims 1-36 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5-39 of U.S. Patent No. 6,719,882 has been overcome. Applicants have submitted a terminal disclaimer.

Serial No. 10/698,217
Docket No. – BAT 0033 NA/40078.251/12755CON1

Conclusion

Applicants respectfully submit that, in view of the above amendments and remarks, the application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
DINSMORE & SHOHL LLP

By Patricia L. Prior
Patricia L. Prior
Registration No. 33,758

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405
E-mail: patricia.prior@dinslaw.com

45490v1